Plug-and-Play Star Sensor for Rapid Spacecraft Integration, Phase II

Completed Technology Project (2009 - 2011)

Project Introduction

Microcosm, with partners Space Micro and HRP Systems, will design, build, and test a plug-and play (PnP) star sensor for small satellites, achieving TRL 6 at the completion of Phase II. All three companies are very experienced in developing PnP systems. On a recent Phase II Air Force SBIR program, Microcosm built and tested a prototype miniature star sensor called MicroMak

TM

, and is building a prototype radiation hard star sensor under a new Phase II Air Force SBIR. The new star sensor proposed here will focus on PnP compatibility for NASA missions of interest, with a mass goal of 0.5 to 0.75 kg. Anticipated NASA applications necessitate a modified version of the baseline MicroMak

TM

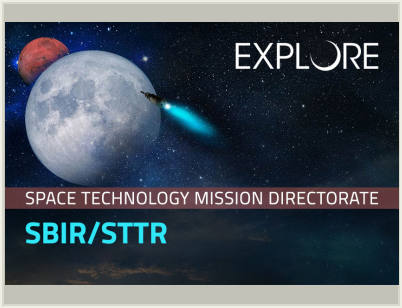
sensor, including: 1) Interfaces compatible with a new PnP avionics architecture, 2) radiation-hardened CMOS focal plane arrays (FPAs), and 3) processing electronics to enable longer mission life. The baseline MicroMak

TM

sensor was designed with inherent radiation-tolerant features: FPAs with no direct view of space, and all-reflective optical elements. The PnP star sensor will leverage MicroMak

TM

heritage, providing a modular, PnP, long-life star sensor for NASA missions, providing a cost and mass reduction of a factor of 2 or more over existing star sensors.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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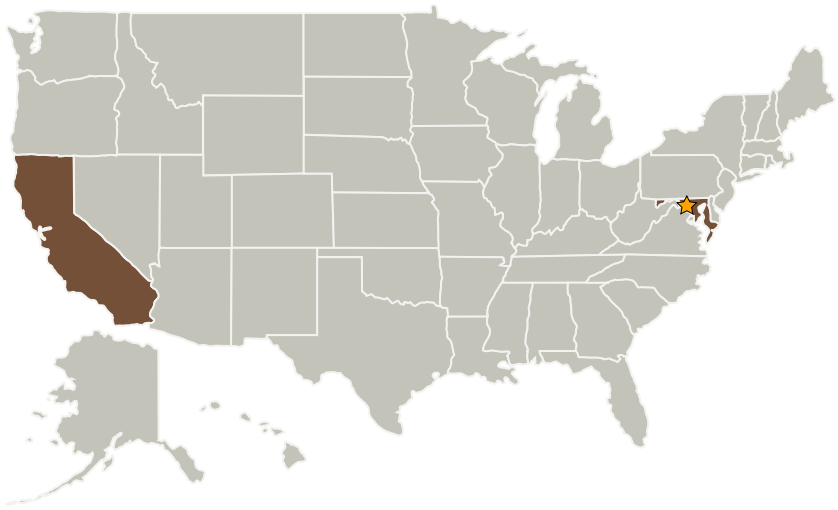
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Microcosm, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Hawthorne, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

April 2009: Project Start

May 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.4 Attitude Estimation Technologies
    - TX17.4.3 Attitude Estimation Sensors